RESEMBLANCES BETWEEN THE CLINICAL EFFECTS OF PNEUMOCOCCIC AND MENINGOCOCCIC INFECTIONS.

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The systematic employment of blood culture methods in all cases of obscure infections has shown that the pneumococcus is frequently the cause of clinical pictures which differ widely from one another and from the commonest effect of this organism, croupous pneumonia. However, careful review of any large number of these cases will show that there are certain features which recur with great constancy, no matter how much the cases may differ from one another. These phenomena I have come to regard as the specific effects of the pneumococcus, and from them I have been able repeatedly to predict the results of the blood culture. These effects are four in number, and while no one of them is peculiar to the pneumococcic infection, the combination of three of them, much less all four of them, is seen in the course of no other infection except one.

The first of these is the acuity of the onset of the symptoms of infections. Pneumonia is conspicuously a disease of sudden onset, the patient in most instances being able to fix not only the day, but in many instances the hour, and even the minute, when the symptoms began. This is equally true of other forms of pneumococcic infections. The sudden onset of symptoms is, of course, not peculiar to this infection, for there are numerous other organisms which initiate symptoms equally suddenly.

The second effect is the polymorphonuclear leukocytosis, and it, too, is common to many other infectious processes, some of which are also characterized by sudden onset, although there are several of the very acute infectious processes unaccompanied by leukocytosis.

The third effect of the pneumococcus, an herpetic eruption, is much more highly specific, being present in a large, though not constant percentage of the cases, and being common to but two other infections, namely, malaria, a process due to an organism of so widely differing nature that no consideration of it is here necessary, and secondly, meningococcic infection, in which, like the pneumococcic infections, herpes is very common. Moreover, the herpetic eruption occurs usually over the same nerves, one or the other of the lower branches of the fifth cranial nerves, although in either it may occur over any other nerves. The herpetic eruption in the cases of meningitis is not to be referred to the meningitis, for in no other form of inflammation of this membrane is herpes common, except in those cases which are due to the pneumococcus.

When we consider these three effects, not singly, but in a group, one finds that while there are many infections causing a combination of the first and second and one infection causing the combination of the first and third, there is no other infectious disease in which all three of them occur, except in cases of the so-called epidemic meningitis.

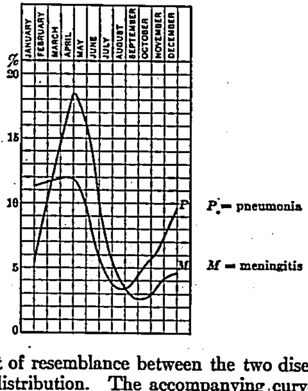
Now, if to these three one other is added, the resemblance between the two processes is not increased by any mere arithmetical, but by a considerable geometrical, progression.

For years the extremely low chloride excretion in the urine in cases of pneumonia has been appreciated and has been utilized both as a means of diagnosis and prognosis, but it is not yet as generally known as it should be that in other forms of pneumococcic infections, such as tonsillitis, endocarditis, meningitis, sepsis without localization, the same extremely low chloride excretion is found. This I regard as a fourth specific effect of pneumococcic infection.

Naturally this has suggested a study of the urine of cases of meningitis as to the chloride excretion. No light upon the subject is thrown by a study of the literature, for as far as I have been able to find no mention is made of it, but in all the cases of epidemic meningitis which I have seen of late not a large number, it is true, have shown the same low chloride excretion which is shown by cases of pneumonia. We find, therefore, that while there are several infectious processes which show combinations of two of the specific effects of pneumococcic infections, there is no other except the meningococcic infection which shows a combination of three, much less one of all four of these effects.

These, however, do not exhaust the similarities between the two infections. There are certain complications which occur with greater or less frequency with pneumococcic infections, such as endocarditis, pericarditis, arthritis, and otitis media, and it is interesting to note that these same complications occur also with the meningococcic infections. Not much stress can be laid upon this, for these same things occur in many other infections. There is, however, one point upon which I should like to lay some stress, namely, that of the endocarditis. It has long been my opinion, based purely upon clinical observation, that endocarditis of pneumococcic origin occurs when the cocci are of low virulence, and this opinion has recently been experimentally confirmed by Rosenau. If, then, the suspicion is correct that the meningococcus is a pneumococcus of lowered virulence, then one would expect to find endocarditis more common as a complication of the epidemic meningitis than it is in pneumonia in the young. Pneumococcic endocarditis as a complication of pneumonia of the old or of those having an antecedent valvular lesion must be excluded from consideration. One must also make allowance for the fact that certain of the cases of meningitis run so acute a course that there is not time enough to recognize clinically a developing endocarditis. Nothing very definite can be said upon endocarditis as a complication of meningitis, because of the lack of data in literature; even in the reports upon autopsies made but few details are stated. I feel sure that the lessened mortality from this disease, such as we seem warranted in expecting from the antimeningococcic serum, will be accompanied by numerous reports of subsequent endocarditis.

The frequency with which meningitis is accompanied by pneumonia may have some bearing upon the question of the relationship of the two organisms, but here again we lack data. Practically all of the early literature upon the question is valueless, and no doubt many of the instances in which the two processes were associated are due to the pneumococcus, which admittedly may cause either or both.



Another point of resemblance between the two diseases is that of their seasonal distribution. The accompanying curves (see chart) show the percentage distribution according to months. They are rather grossly alike, but would probably more closely resemble each other if they were upon anything like a similar number of cases. The pneumonia curve by its smoothness suggests that it is based upon a large series of cases, and this is true, for it is made up from tables including over 600,000 cases, while the meningitis curve is based on but 6000 bacterially confirmed cases.

It was formerly stated that the epidemic meningitis did not end by crisis, one of the most striking peculiarities of the pneumococcic infections, and this was true, but since the introduction of the

Flexner-Jobling serum, this is no longer so, for all who have observed the effects of this serum in many cases report endings as critical as any seen in pneumonia.

Another interesting thing about the epidemic meningitis is that cases occur sporadically separated from all known sources of infection and this, too, though the meningococcus is an organism known to have but little resistance to outside influences. This fact is difficult to explain if one admits that the meningococcus is an independent organism, but not so difficult if one assumes that it is merely a modified pneumococcus, an organism which is practically ubiquitous.

It must be admitted that many, possibly the great majority of the cases of sporadic epidemic meningitis are not truly instances of this disease, but even so, there seems nowhere any disposition to question the occurrence of sporadic cases.

In contrast with these clinical resemblances one finds certain others of clinical differences which are significant, namely, the striking difference in the age distribution of the two diseases, one being conspicuously a disease of childhood, while the other occurs most often in adult life. The second point is the frequency with which the meningitis is associated with a hemorrhagic diathesis, as shown by petechial eruptions. Such a diathesis is not unknown in pneumonia, but it is extremely rare. I can recall but two instances of it, if one excludes the not infrequent cases of early hemoptysis in pneumonia.

It appears to me that the points of resemblance between the two infections are sufficiently striking to warrant serious consideration by the bacteriologists who, without exception, I believe, regard the two causal organisms as absolutely distinct, although admitting that they have many points in common, so many, indeed, that their differentiation is so difficult that much of the early work upon the bacteriology of meningitis and notably that of the nose and pharynx in this disease must be disregarded.

THE DIAGNOSIS AND SURGICAL TREATMENT OF ACUTE PANCREATITIS.

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The diseases of the pancreas are, at the present time, being subjected to an ever-increasing amount of clinical observation and to experimental research of the most varied forms. Especially is this true of acute pancreatitis, a disease which in its several varieties